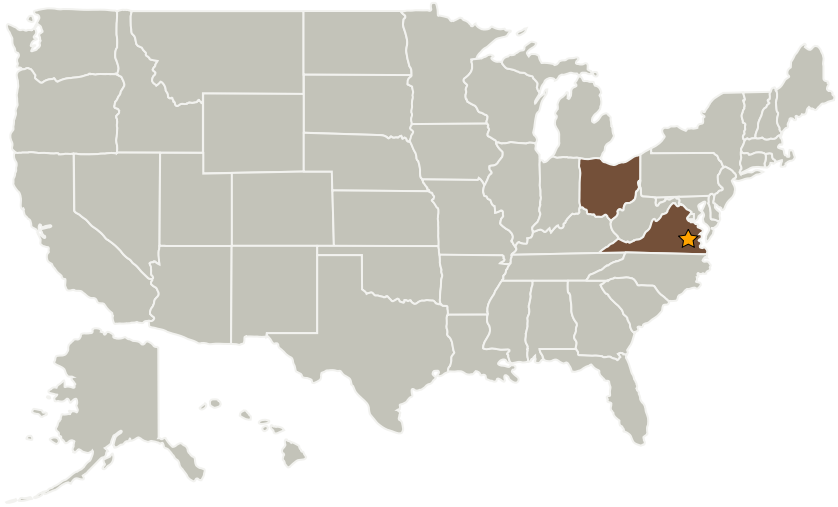
Nanofiber Additions for Tailorable Vibration Damping Materials, Phase I

Completed Technology Project (2006 - 2006)

Project Introduction

The goal of NASA's Quiet Aircraft Technology project is to reduce perceived aircraft noise by half in 10 years and by 75 percent in 25 years, using 1997 levels as the baseline. These reductions are necessary to meet the expected demand for air travel and increasingly stringent noise standards around the world. A significant portion of noise reduction will be achieved through lighter aircraft as a result of advances in composite materials, such as nanocomposites. Vibrations are undesirable for structures, due to the need for structural stability and dynamic response, position control, and durability. Vibration and acoustic reduction can be obtained in structural materials by increasing the damping capacity (expressed by the loss factor) and/or decreasing the stiffness (expressed by the storage modulus). It is proposed to investigate carbon nanofiber composites for their expected acoustic damping properties by adjusting fiber volume fraction and length to appropriately tailor acoustic damping responses for this material. Nanocomposites based on carbon nanofibers have high potential for advances in material performance (weight specific strength and stiffness, vibration damping, flammability reduction, and electrical conductivity) as well as manufacturing simplification and cost reduction.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Applied Sciences Inc	Supporting Organization	Industry	Cedarville, Ohio

Primary U.S. Work Locations	
Ohio	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.6 Materials for Electrical Power Generation, Energy Storage, Power Distribution and Electrical Machines